

CLAIMS

1. A diffused gas aeration apparatus comprising: a cylindrical passage tube substantially disposed vertically in which fluid passes in the longitudinal direction and in which a static mixer is provided, and a gas blowoff portion on the lower end side of said passage tube, which gushes and supplies gas to the inside of said passage tube through a pneumatic dispatch line and in which a spray nozzle is provided; wherein gas is supplied to said gas blowoff portion, liquid is introduced into said passage tube from the lower side of said passage tube, said gas and liquid flow upward in a parallel direction in said passage tube, and the gas and liquid come in gas-liquid contact inside said passage tube to be discharged from the upper end side of said passage tube into liquid.

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2. A diffused gas aeration apparatus comprising: a cylindrical passage tube substantially disposed vertically in which fluid passes in the longitudinal direction and in which a static mixer is provided, and a gas blowoff portion on the lower end side of said passage tube, which gushes and supplies gas to the inside of said passage tube through a pneumatic dispatch line and in which a static mixer is provided; wherein gas is supplied to said gas blowoff portion, liquid is introduced into said passage tube from the lower side of said passage tube, said gas and liquid flow upward in a parallel direction in said

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passage tube, and the gas and liquid come in gas-liquid contact inside said passage tube to be discharged from the upper end side of said passage tube into liquid.

5 3. A diffused gas aeration apparatus according to claim 1 or 2, wherein said static mixer has a plurality of spiral blades which are either right twisted (clockwise) or left twisted (counterclockwise), a plurality of fluid passages are formed inside said passage tube, said fluid passages are continuously
10 joined to one another through an opening of blades in the longitudinal direction, and said blades are formed of perforated boards.

 4. A diffused gas aeration apparatus according to claim 3,
15 wherein the diameter of holes bored in said blades are in the range of 5 to 30mm.

 5. A diffused gas aeration apparatus according to claim 3, wherein the aperture ratio of holes bored in said blades is in
20 the range of 5 to 80%.

 6. A diffused gas aeration apparatus according to any one of claims 1 to 5, wherein the rising speed of gas in said passage tube is in the range of 0.1 to 10m/s.

7. A diffused gas aeration apparatus according to any one of claims 1 to 5, wherein the rising speed of gas in said passage tube is in the range of 0.5 to 5m/s.

5 8. A diffused gas aeration apparatus according to any one of claims 3 to 7, wherein the twist angle (spiral angle) of blades is 15°, 30°, 45°, 60°, 90°, 180° or 270°.

9. A diffused gas aeration apparatus according to any one
10 of claims 1 to 3, wherein the supplying rate of the amount of air which flows from the lower side to the upper side inside said diffused gas aeration apparatus is, when the water depth inside an aeration tank is 2 to 6m, in the range of 1800 to 21000 m³·hour.

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10. A diffused gas aeration apparatus according to any one of claims 1 to 3, wherein the supplying rate of the amount of air which flows from the lower side to the upper side inside said diffused gas aeration apparatus is, when the water depth
20 inside an aeration tank is 2 to 6m, in the range of 3600 to 12000 m³·hour.

11. A diffused gas aeration apparatus according to any one of claims 1 to 3, wherein the supplying rate of gas which flows
25 from the lower side to the upper side inside said diffused gas

aeration apparatus is, when the water depth inside a diffusion tank is 1 to 3m, in the range of 3600 to 18000 m³/m²·hour.

12. A diffused gas aeration apparatus according to any one
5 of claims 1 to 3, wherein the supplying rate of gas in a bioreactor, which flows from the lower side to the upper side inside said diffused gas aeration apparatus is in the range of 0.1 to 5m/s.